

Produced by Chongqing Hesheng Longgang Technology Co., Ltd. (manufacturer)

## Basalt fiber reinforcement (new material to replace reinforcement)

Product Description: basalt fiber reinforced bar (BFRP) is a new composite material formed by pultrusion process. It is made of basalt fiber as reinforcement, resin, filler and curing agent. Now it has been widely used in construction, highway and bridge construction.

Basalt fiber reinforcement can completely replace ordinary steel reinforcement and deformed steel; Compared with ordinary reinforcement, it has strong advantages: (see Annex for technical parameters)

1. The cost is the same as that of ordinary reinforcement;
2. The strength is 200% of the ordinary reinforcement with the same specification and diameter; The tensile strength reaches 1100mpap; The reinforcement is only 450MPa,
3. Basalt fiber reinforcement, especially with high acid, alkali and corrosion resistance, is a kind of electrical insulator that will never rust.
4. Basalt fiber reinforced bar, which is non-magnetic. It has high tolerance to the moisture concentration in cement mortar and the penetration and diffusion of carbon dioxide, and can prevent the corrosion of concrete structure in harsh environment, so as to improve the durability of buildings and bridges.
5. The specific gravity of basalt fiber reinforcement is 1.9-2.1g/cm<sup>3</sup>; The specific gravity of steel and reinforcement is 7.85/cm<sup>3</sup>; The diameter weight of the same specification is 370% lighter than that of steel reinforcement, and the strength is 200% of that of steel reinforcement.
6. The physical properties of basalt fiber reinforcement are higher than that of steel reinforcement, and the cost is the same as that of steel reinforcement, which is of epoch-making significance to replace steel reinforcement.

## Performance comparison between basalt fiber reinforcement and ordinary reinforcement

| project                         | BFRG        | steel rebar |
|---------------------------------|-------------|-------------|
| tensile strength (Mpa)          | $\geq 1100$ | $\geq 400$  |
| yield strength (Mpa)            | $\geq 250$  | $\geq 300$  |
| Modulus of elasticity (Gpa)     | $\geq 50$   | $\geq 200$  |
| proportion (g/cm <sup>3</sup> ) | 1.9-2.1     | 7.85        |

## Comparison between ordinary reinforcement and basalt reinforcement

| Serial number | project  | BFRG    | steel rebar | BFRG    | steel rebar | BFRG    | steel rebar | BFRG    | steel rebar | BFRG    | steel rebar |
|---------------|--|---------|-------------|---------|-------------|---------|-------------|---------|-------------|---------|-------------|
| 1             | Specifications (mm)                              | 8       |             | 10      |             | 16      |             | 20      |             | 22      |             |
| 2             | weight (g/m)                                     | 95      | 394         | 150     | 616         | 382     | 1578        | 600     | 2465        | 720     | 2983        |
| 3             | Length per ton (m)                               | 10526   | 2536        | 6667    | 1623        | 2618    | 634         | 1667    | 406         | 1389    | 335         |
| 4             | Tensile resistance (KN)                          | 55      | 23          | 86      | 35          | 221     | 90          | 345     | 141         | 345     | 171         |
| 5             | Price per meter (USD)                            | 0.30    | 0.31        | 0.48    | 0.49        | 1.21    | 1.25        | 1.90    | 1.96        | 2.29    | 2.37        |
| 6             | Unit price (USD / ton)                           | 3175    | 794         | 3175    | 794         | 3175    | 794         | 3175    | 794         | 3175    | 794         |
| 7             | Price difference per 10000 meters (USD)          | -114.16 |             | -128.77 |             | -393.14 |             | -515.08 |             | -813.72 |             |
| 8             | Saving rate of using composite reinforcement (%) | 3.79%   |             | 2.70%   |             | 3.24%   |             | 2.70%   |             | 3.56%   |             |